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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/608,874	06/30/2000	Jyoti Mazumder	POM-12302/29	2635

7590 10/28/2005

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EXAMINER

GARLAND, STEVEN R

ART UNIT PAPER NUMBER

2125

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/608,874

Applicant(s)

MAZUMDER, JYOTI

Examiner

Steven R. Garland

Art Unit

2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-10 are pending.
2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 5, "the beam" lacks a proper antecedent basis. Also in claim 1 it is unclear if a metal or a generic material is being deposited. Note that line 2 requires a metal but the rest of the claim only recites a generic material. Also note is taken that the specification appears to require that DMD be direct metal deposition. Similar comments apply to claim 6.

Claim 2, line 1, " the laser used to deposit the material " lacks a proper antecedent basis.

Claim 4, line 1 , " the location" and in line 2, "the location and/or magnitude of the residual stress " both lack a proper antecedent basis. Claim 9 has a similar problem.

Claim 6, line 2, " the build-up" lacks a proper antecedent basis.

4. Applicant's arguments, see page 4, lines 12-16, filed 8/29/05, with respect to Beaman et al. have been fully considered and are persuasive. The rejection of claims 1-10 under 35 U.S.C. 103 has been withdrawn. However, upon further consideration, new ground(s) of rejection are made and are set forth below.

Art Unit: 2125

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Sterett et al. 5,746,844 .

First it is noted that the claimed subject matter is only entitled to the filing date of the provisional application in which the stress relief using a laser is first disclosed.

Sterett et al. teaches direct metal deposition DMD in the form of molten metal deposition and then a laser is used to anneal the metal to reduce stress. The annealing inherently takes place at a temperature below the melting point at which the grains of metal recrystallize. See the title, abstract; figures; col. 5, lines 34-67; col. 11, lines 46-52; col. 16, lines 23-40; and claim 1. Note the cited heat treatment (metallurgy) article by Averbach.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beaman et al. 5,352,405 in view of Sterett 5,746,844.

Beaman et al. teaches depositing a powder, sintering the powder using a laser and then using the laser to insure that the adjacent parts are sintered together (col. 7,

lines 46-51) for structural integrity by overlapping the scans. See the abstract; figures; col. 1, lines 44-50; col. 7, line 39 to col. 8, line 5. Beaman also teaches that if necessary annealing can be performed depending on the material powder being used and the final use of the product. Col 6, lines 44-51.

Beaman however does not specifically disclose that a metal powder is being used, but does teach the use of metal powders.

It would have been obvious to one of ordinary skill in the art to modify Beaman in view of Beaman's teaching and use a metal powder so that an accurately built metal object could be formed.

Beaman also fails to teach the use of a laser to perform the annealing process.

Sterett et al. teaches the use of a laser to anneal a metal to reduce stress. The annealing inherently takes place at a temperature, below the melting point, at which the grains of metal recrystallize. See the title, abstract; figures; col. 5, lines 34-67; col. 11, lines 46-52; col. 16, lines 23-40; and claim 1. Note the cited heat treatment (metallurgy) article by Averbach.

It would have been obvious to one of ordinary skill in the art to modify Beaman in view of Sterett and use a laser for annealing so that the object could be immediately used.

In response to applicant's arguments about the metal object of Beaman, the examiner stated that the use of a metal powder would allow an accurately built metal object to be made not simply that the use of the metal would increase the accuracy of the object fabrication.

9. Claims 2-5 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beaman et al. 5,352,405 in view of Sterett 5,746,844 as applied to claims 1 and 6 above, and further in view of Murnick 5,427,825.

Beaman et al. teaches depositing a powder, sintering the powder using a laser and then using the laser to insure that the adjacent parts are sintered together (col. 7, lines 46-51) for structural integrity by overlapping the scans. See the abstract; figures; col. 1, lines 44-50; col. 7, line 39 to col. 8, line 5. Beaman also teaches that if necessary annealing can be performed depending on the material powder being used and the final use of the product. Col 6, lines 44-51.

Beaman however does not specifically disclose that a metal powder is being used, but does teach the use of metal powders.

It would have been obvious to one of ordinary skill in the art to modify Beaman in view of Beaman's teaching and use a metal powder so that an accurately built metal object could be formed.

Beaman also fails to teach the use of a laser to perform the annealing process.

Sterett et al. teaches the use of a laser to anneal a metal to reduce stress. The annealing inherently takes place at a temperature, below the melting point, at which the grains of metal recrystallize. See the title, abstract; figures; col. 5, lines 34-67; col. 11, lines 46-52; col. 16, lines 23-40; and claim 1. Note the cited heat treatment (metallurgy) article by Averbach.

It would have been obvious to one of ordinary skill in the art to modify Beaman in view of Sterett and use a laser for annealing so that the object could be immediately used.

Beaman and Sterett however do not teach use the same laser to perform both deposition and annealing. Beaman and Sterett also do not teach the use of a plurality of lasers or defocus the beam to control stress.

Murnick teaches fusing a powdered material using a laser and then controlling the cooling of the fused material using a laser during the annealing step to reduce stress. Murnick teaches a variety of methods such as using the same beam to control both stress and melting; using a plurality of lasers for cooling; adjusting the focus or intensity of the laser to control cooling. See the abstract; figures; col. 2, lines 40-55; col. 3, line 13 to col. 4, line 37; col. 4, line 67 to col. 5, line 11; col. 5, lines 55-63; col. 9, lines 28-66; col. 11, line 58 to col. 12, line 35; and the claims.

It would have been obvious to one of ordinary skill in the art to modify Beaman and Sterett in view of Murnick to use multiple beams or defocus the beam to reduce stress.

Further it would have been obvious to one of ordinary skill in the art to modify Beaman and Sterett in view of Murnick to use the same laser to both deposit the material and to reduce the stress to reduce the required number of lasers.

10. In the following rejections the metal recited in the preamble has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a

process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

11. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Murnick 5,427,825.

Murnick teaches fusing a powdered material using a laser and then controlling the cooling of the fused material using a laser during the annealing step to reduce stress. Murnick teaches a variety of methods such as using the same beam to control both stress and melting; using a plurality of lasers for cooling; adjusting the focus or intensity of the laser to control cooling. See the abstract; figures; col. 2, lines 40-55; col. 3, line 13 to col. 4, line 37; col. 4, line 67 to col. 5, line 11; col. 5, lines 55-63; col. 9, lines 28-66; col. 11, line 58 to col. 12, line 35; and the claims.

12. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murnick 5,427,825.

Murnick teaches fusing a powdered material using a laser and then controlling the cooling of the fused material using a laser during the annealing step to reduce stress. Murnick teaches a variety of methods such as using the same beam to control both stress and melting; using a plurality of lasers for cooling; adjusting the focus or intensity of the laser to control cooling. See the abstract; figures; col. 2, lines 40-55; col. 3, line 13 to col. 4, line 37; col. 4, line 67 to col. 5, line 11; col. 5, lines 55-63; col. 9, lines 28-66; col. 11, line 58 to col. 12, line 35; and the claims.

Murnick while teaching the use of powered material during material deposition does not specifically show its use. Col. 4, line 67 to col. 5, line 5.

It would have been obvious to one of ordinary skill in the art to modify Murnick to use powered material to repair an object and give the proper appearance in view of the teaching of Murnick.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yu et al. 5,094,977 is of interest in use of a laser to reduce stress in a metal.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven R. Garland whose telephone number is 571-272-3741. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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